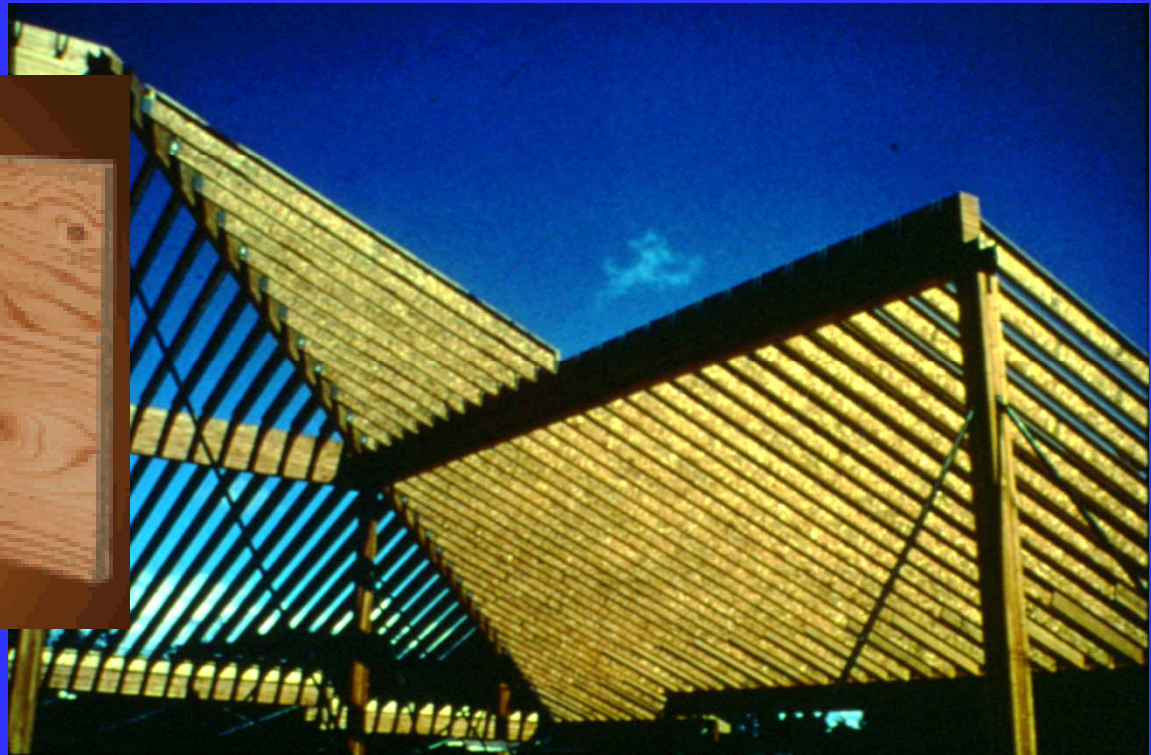


Wood I-Joists and Firefighter Safety



American Wood Council
Engineered and Traditional Wood Products



Presentation Outline

Concern has been raised about the hazard from wood I-joint floor collapses during fires

This presentation:

- **provides general information about wood I-joists and their use**
- **provides information on the relationship between wood I-joists and firefighter casualties**
- **details firefighter educational material developed by the wood industry**





Wood I-Joist Popularity

- Efficient use of resources (trees)
- Desired attributes for architectural design
- Desired attributes for structural performance



Resource Efficiency



Wood I-joists qualify as a resource-efficient framing material in many green building standards



Architectural Design



Design flexibility with greater open spaces

- Manufactured to required length



**I-Joists used as
floor framing**

Structural Performance



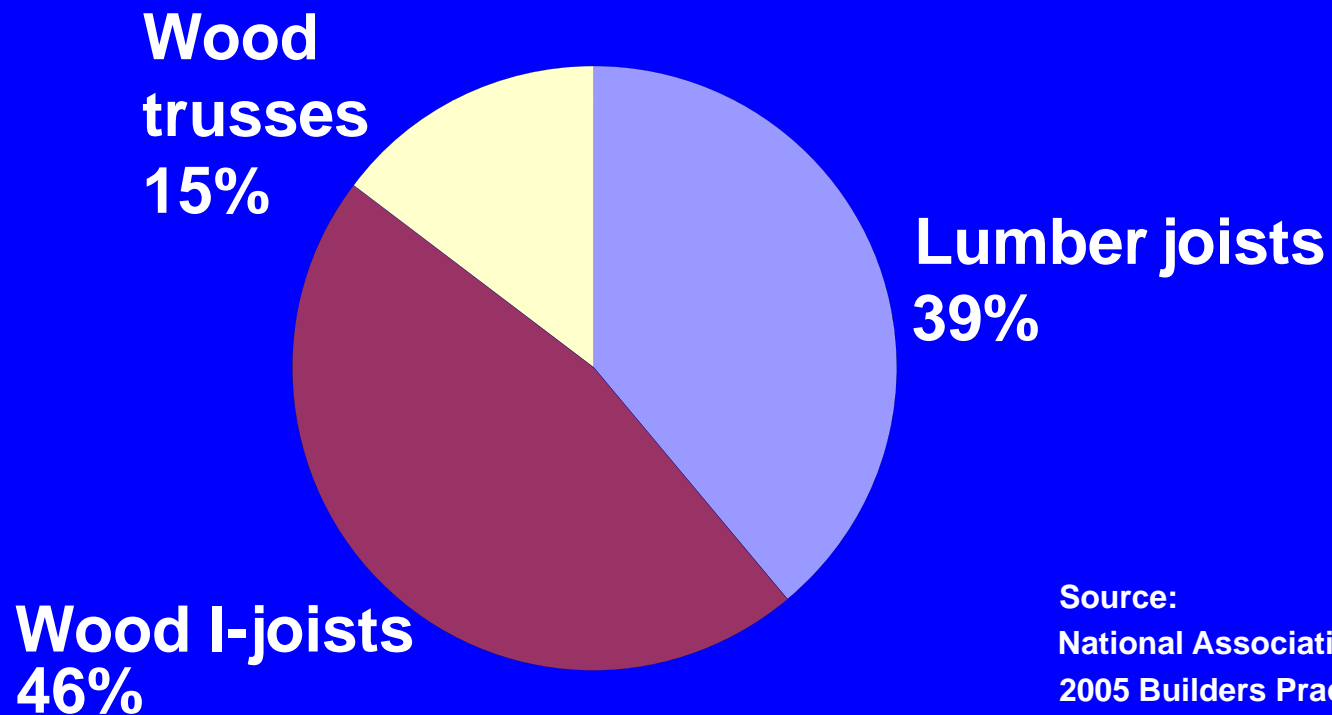
Strength and stiffness of wood I-joists are established through engineering and testing



How Popular are Wood I-Joists?



Floor assembly by type (2005 statistics)



Source:
National Association of Home Builders
2005 Builders Practices Survey
Single Family Homes - Floors

How Fire Safe are Homes with Wood I-Joists?



Primary Considerations

- Safety of occupants
- Safety of firefighters

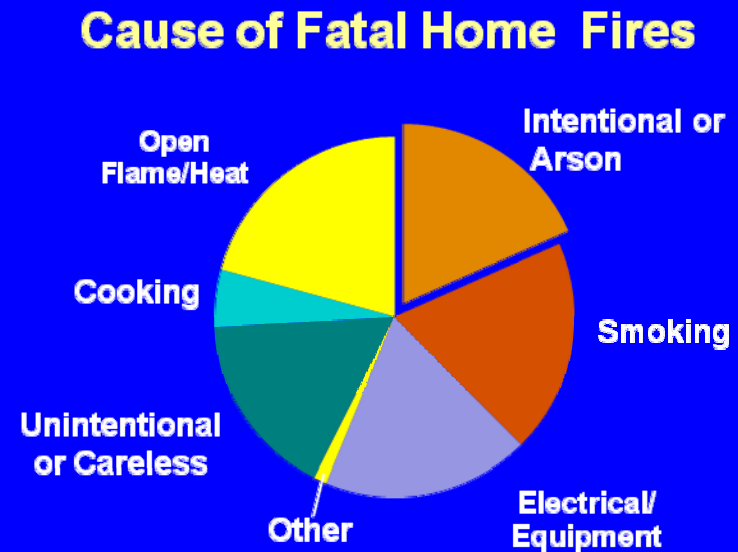
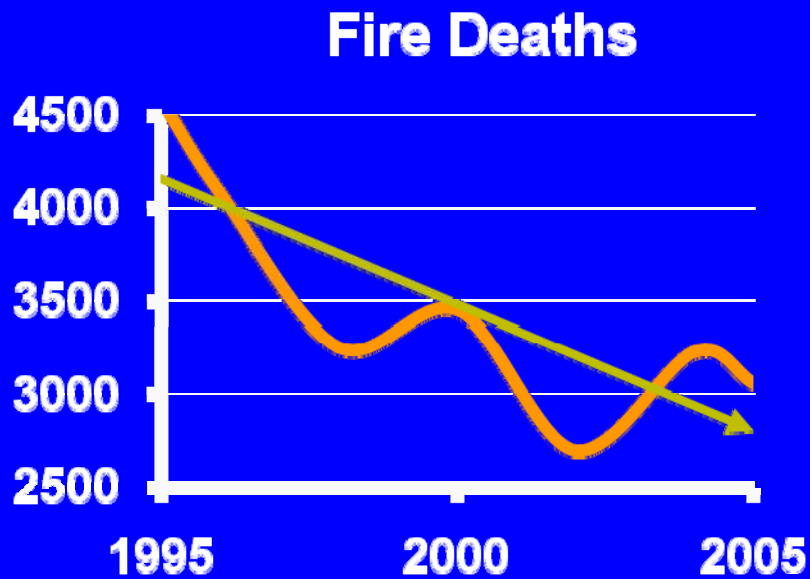
Let's take a look at **both**



Fire Safety of Occupants: Trends and Causes of Fatalities



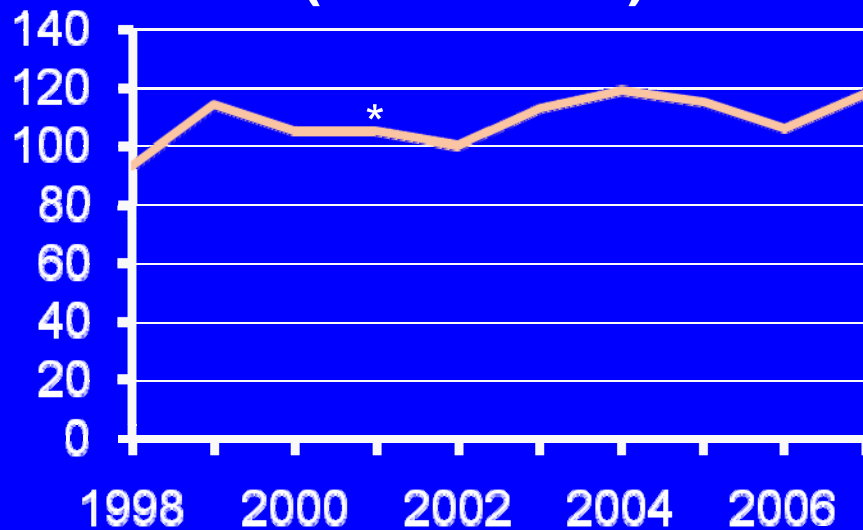
20% reduction in occupant deaths in a decade



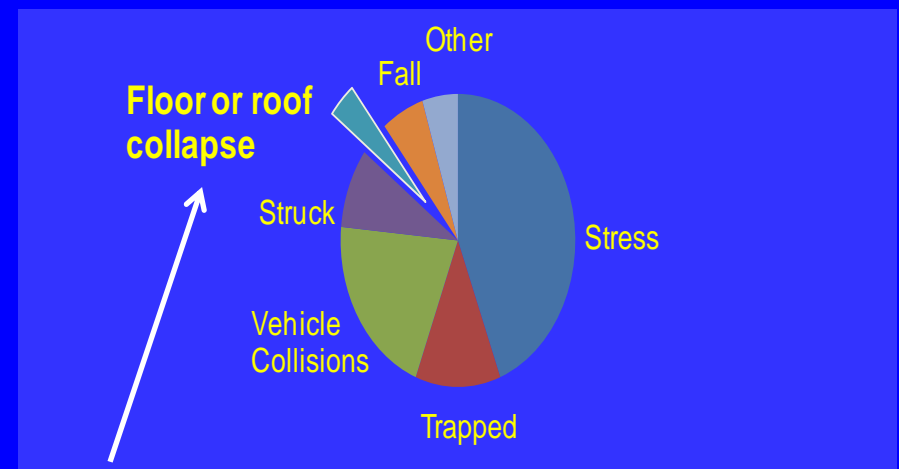
Fire Safety of Firefighters: Affected by Wood I-Joists?



All firefighter fatalities (1998-2007)



Causes of all firefighter fatalities (2000)

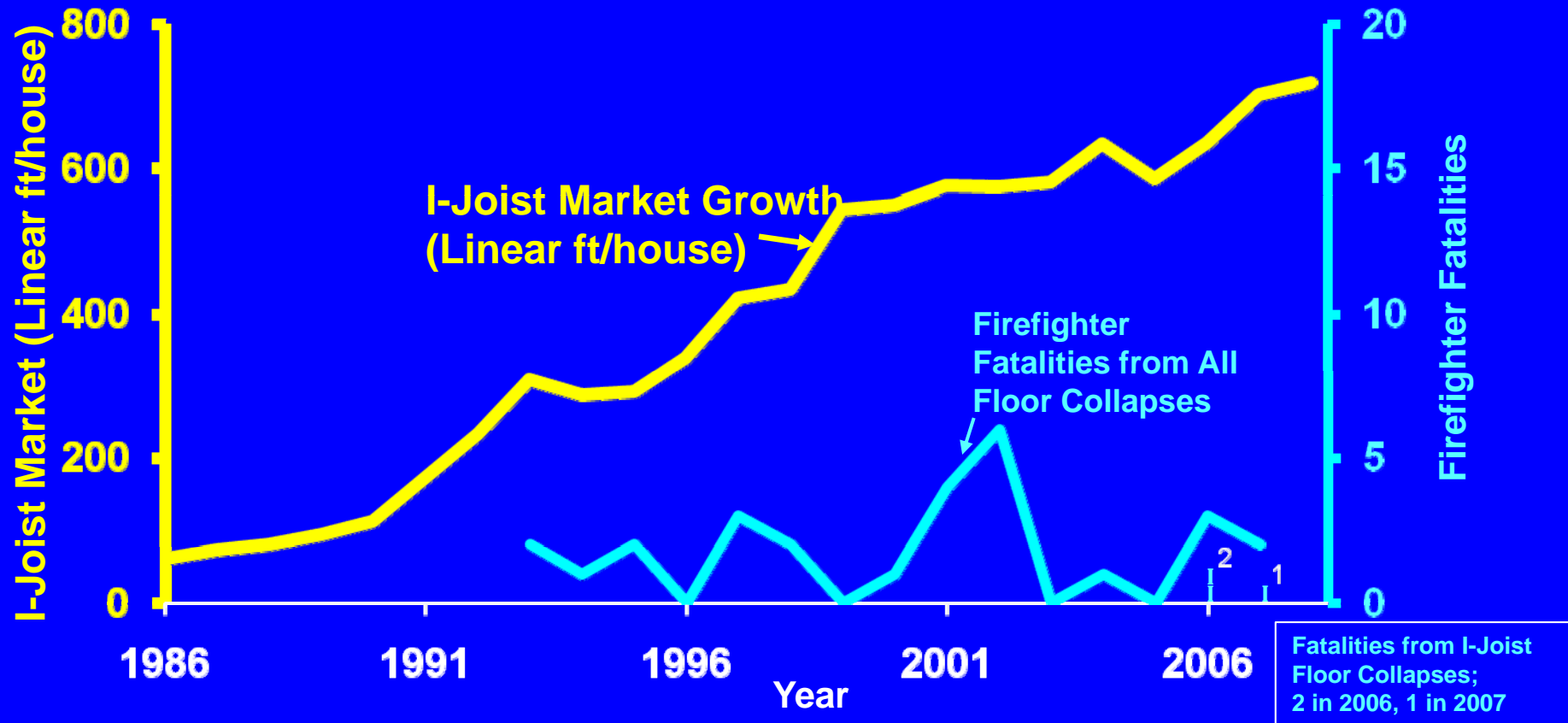


Let's take a close look at floor collapse data

U.S. Fire Administration Firefighter Fatalities in the U.S. in 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007

* Does not include the 344 firefighters who died in the World Trade Center collapse, 2001

Fire Safety of Firefighters: Fatalities in Single-Family Homes Compared to I-Joist Market Growth



Popularity of wood I-joists - no impact on firefighter safety

Firefighter Fatalities



For the decade of 1998-2007

**A total of 1033* firefighters died in the line of duty
(all causes included)**

- **Of those 1033 → 61 died due to structural collapse**
- **Of those 61 → 19 died in single family floor collapses**
- **Of those 19 → 12 were over basements**
- **Of those 12 → 3 died in unprotected I-joist floor collapses over basements**

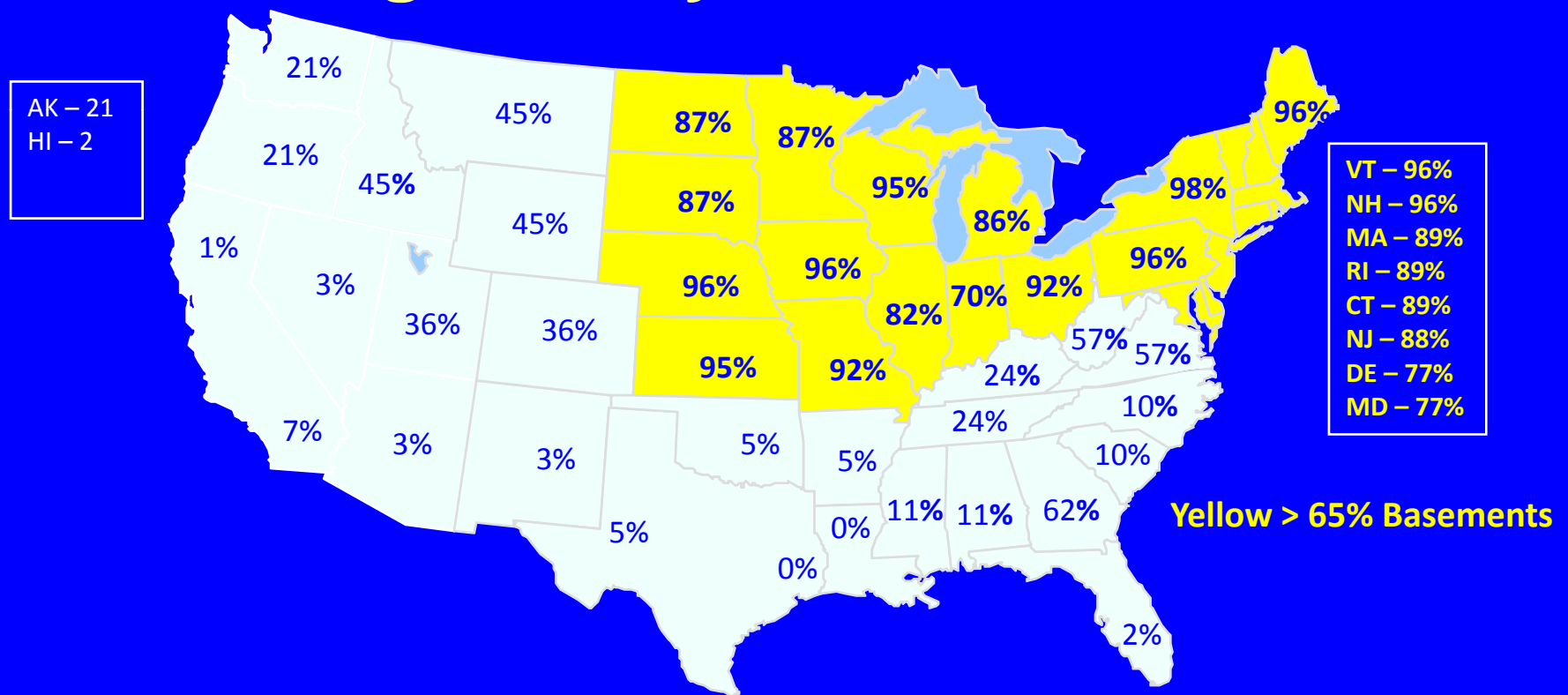


* Does not include the 344 firefighters who died in the World Trade Center collapse



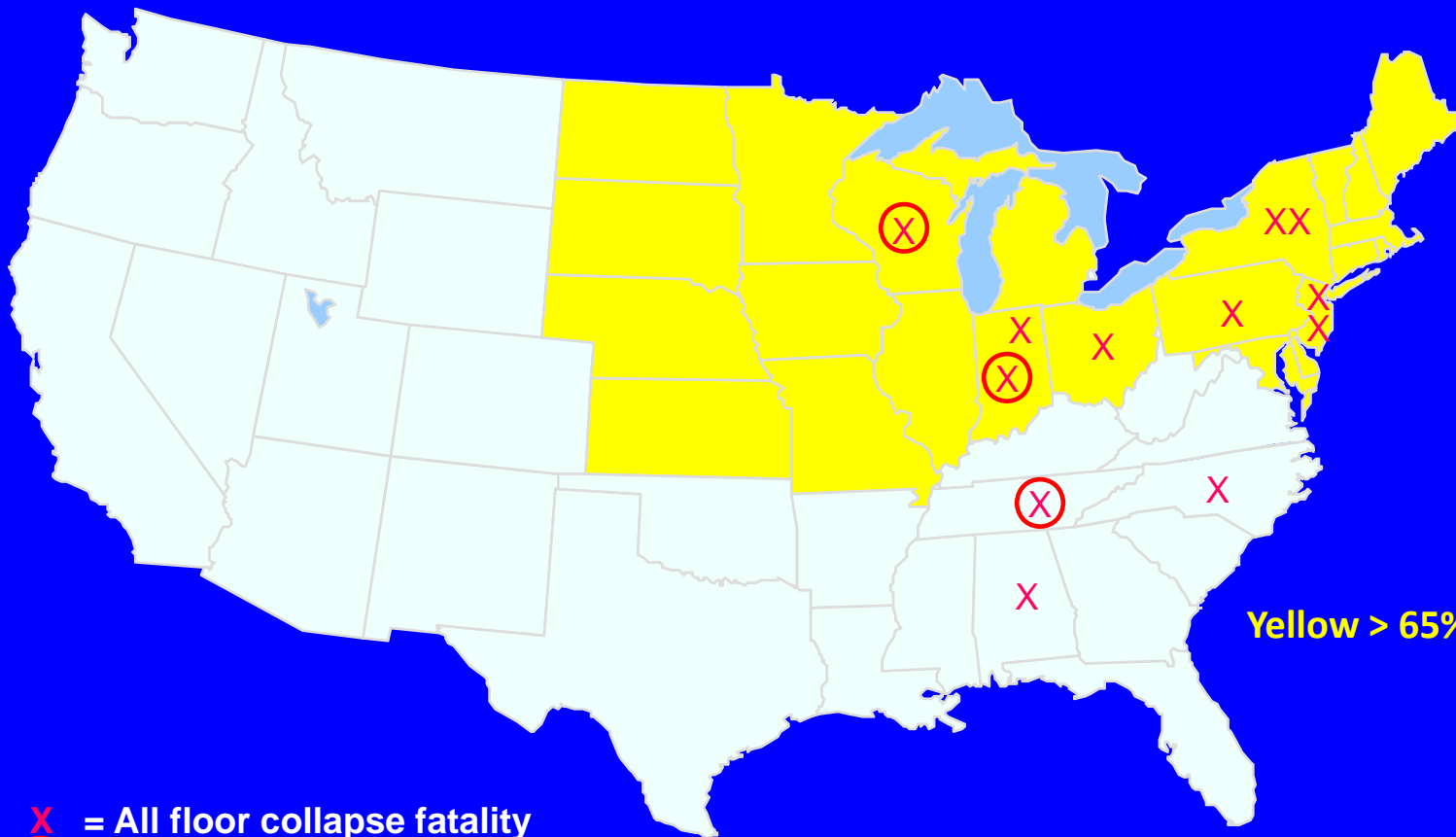
Basements: Where are they?

Percent single family houses with basements



Data Source: NAHB 2007 Builder Practices Survey

Basement Collapse with Fatality 1993-2007



Yellow > 65% Basements

- X = All floor collapse fatality
- (X) = I-joist collapse fatality: IN, WI, TN

Data Source: FEMA Annual Firefighter Fatality Reports

12 floor collapse events
were over basements

Firefighter Education and Training



The wood industry is committed to providing education to the fire service to reduce firefighter deaths from collapse.



Firefighter Education and Training



- Product awareness guides
 - www.woodaware.info
- AF&PA website on fire performance of wood
 - www.awc.org
- Wood products display cases for firefighter training centers



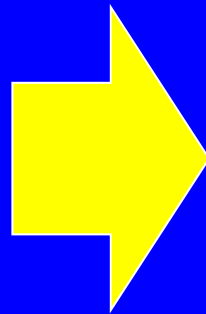
Wood I-joint for hands-on training

Wood I-Joists: One of Many New Features of Modern Construction



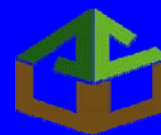
Feature

- Larger homes
- Open floor plans
- Increased fire loads
- Floor/ceiling/attic voids
- New building materials



Fire Effect

- Faster fire propagation
- Shorter time to flashover
- Shorter escape times
- Shorter time to structural collapse



Summary

- **Wood I-joists are popular, resource efficient, and recognized as green**
- **Use of wood I-joists has increased without a corresponding increase in firefighter deaths due to collapse**
- **Floor collapse fatalities occur primarily over basements**
- **Changes in building practices and modern furnishings create new challenges for the fire service**





Our Commitment

AF&PA continues to work with fire service leaders to:

- **define collapse risk of unprotected floors**
- **define factors that contribute to collapse**
- **develop solutions that meet their needs**



Thank You

For more information,
please visit:

www.woodaware.info

